BRITISH COLUMBIA
MINISTRY OF FORESTS AND RANGE

Tree Farm Licence 18

Canadian Forest Products Ltd.

Rationale for Allowable Annual Cut (AAC) Determination

Effective March 9, 2006

Henry Benskin
Deputy Chief Forester

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Objective of this Document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence 18. This document also identifies where new or better information is needed for incorporation in future determinations.

Description of Tree Farm Licence 18

Tree Farm Licence (TFL) 18 is held by Canadian Forest Products Limited (Canfor). In 2004, Canfor acquired Slocan Forest Products Ltd who previously held the TFL.

TFL 18 is located in central British Columbia (BC) in an area known as the North Thompson region. The TFL is located west of the town of Clearwater and Canfor's mill in Vavenby, and south of Wells Gray Provincial Park. The TFL is administered by the BC Forest Service (BCFS) Headwaters Forest District office, based in Clearwater, within the Southern Interior Forest Region.

The total land base within the TFL boundary is 74 542 hectares, with a high percentage considered productive forest (90 percent). The majority of the TFL area is characterized by high-elevation plateau with gently rolling terrain. Numerous small lakes and swamp complexes are located within the TFL. Three biogeoclimatic zones occur: the Engelmann Spruce-Subalpine Fir zone which occupies about 51 percent of the TFL, the Sub-Boreal Spruce which occupies 32 percent, and the Interior Cedar-Hemlock zone representing about 16 percent of the area.

The main commercial tree species are Engelmann and white spruce, lodgepole pine, subalpine fir (also known as balsam), Douglas-fir, western hemlock and western red cedar.

Forestry is the principal employment sector in the North Thompson region. Also significant are the tourism, ranching and transportation sectors. Road access is provided by provincial highway 5 which serves the North Thompson region including Wells Gray Park. There is also a connecting railway that is used to transport forest products from local processing facilities.

Critical issue: Epidemic mountain pine beetle infestation

Mountain pine beetle epidemics are natural events that affect mainly mature lodgepole pine, however, the current infestation has reached an unprecedented level in BC's history. Provincial annual aerial survey data show the beetle affected about 8.5 million hectares in 2005 increasing substantially from seven million hectares recorded in 2004. Of the total area, nearly nine percent of stands were very severely infested (more than 50 percent of the trees killed in the past year), 14 percent experienced severe levels of attack (31 to 50 percent killed), 25 percent sustained moderate mortality (11 to 30 percent killed), 27 percent sustained light amounts of attack (one to ten percent killed, and 25 percent showed trace amounts of attack (less than one percent of trees in the stand killed in the past year). In fall 2005, it was estimated that the mountain pine beetle infestation affected about 411 million cubic metres of timber, up from about 283 million cubic metres estimated in fall 2004. Both the extent and severity of the epidemic are expected

to increase in the future. Preliminary results of the 2005 survey data for the interior of BC indicate the epidemic is progressing more rapidly than previously thought.

In determining AACs, the *Forest Act* (section 8(8)(e)) requires consideration of "*abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area*".

On January 1, 2004 (the start date of the harvest forecasts provided in the timber supply analysis) an estimated 3 460 640 cubic metres of mature pine volume in TFL 18 were considered susceptible to attack by the mountain pine beetle. A significant portion of the current AAC in TFL 18 is dedicated to harvesting infested or susceptible lodgepole pine stands. Even so, current efforts are believed insufficient to address projected pine mortality due to the epidemic. There is an opportunity to increase the harvest of currently infested and susceptible stands to enable them to be economically salvaged and reforested.

Canfor initially requested an AAC uplift to 237 000 cubic metres in 2004 when the beetle infestation was still at an early stage within the TFL. After the spring forest health surveys in 2005, when greater than expected levels of mountain pine beetle were observed in the TFL, Canfor proposed a further increase in the AAC to 264 500 cubic metres. The fall 2005 mountain pine beetle surveys showed even higher levels of dead and infested pine than expected which led Canfor to further revise its AAC recommendation to 325 000 cubic metres.

I discuss this critical factor including the request for an increase in the AAC further under *mountain pine beetle epidemic*.

History of the AAC

TFL 18 was originally issued to Clearwater Timber Products Ltd in 1954, assigned to Slocan Forest Products Ltd in 1987, and then assigned to Canfor when it purchased the license from Slocan in 2004.

The AAC was set at 70 792 cubic metres in 1955 and substantially increased incrementally during subsequent years to 210 000 cubic metres by 1983. The increases were due primarily to the expanding use of lodgepole pine as a commercial species, closer utilization practices, and improved inventory information. The AAC then began to incrementally decrease by relatively small amounts to the current AAC which is set at 177 650 cubic metres.

New AAC determination

Effective March 9, 2006, in response to the need to address the mountain pine beetle epidemic and other forest health concerns, and as a result of improved productivity estimates for TFL 18, the new AAC for TFL 18 will be 290 000 cubic metres. This AAC is intended to address salvage harvesting of lodgepole pine-leading stands that are, or are highly susceptible to being, attacked by the mountain pine beetle, and other stands affected by other forest health agents such as the spruce bark beetle. This AAC will remain in effect until a new AAC is determined, which must take place within five years of the present determination.

Information sources used in the AAC determination

Key information sources used in this determination include:

- *Proposed Management Plan No. 10 for Tree Farm Licence 18.* Canadian Forest Products Limited. July 15, 2005. Recommended for approval by Regional Executive Director, Southern Interior Forest Region on December 13, 2005;
- *Tree Farm Licence # 18, Timber Supply Analysis Report.* Prepared for Canadian Forest Products Ltd. by Forest Ecosystems Solutions Ltd. June 10, 2005. Accepted by the BCFS on July 5, 2005;
- *Tree Farm Licence #18, Timber Supply Analysis Information Package.* Prepared for Canadian Forest Products Ltd. by Forest Ecosystems Solutions Ltd. June 2004. Re-submitted October 28, 2004. Accepted by the BCFS on January 12, 2005;
- *Tree Farm Licence #18, Twenty-year Plan.* Canadian Forest Products Ltd. February 10, 2005. Accepted by the BCFS May 6, 2005;
- *Growth and Yield of Residual Balsam Stands on TFL 18.* Prepared for Canadian Forest Products Ltd by J. S. Thrower & Associates Ltd. October 16, 2003;
- *Yield Table Projections for Residual Balsam Stands on Canadian Forest Products Ltd TFL 18.* Prepared for Canadian Forest Products Ltd by J. S. Thrower & Associates Ltd. 2004;
- *Potential Site Index Estimates for the Major commercial Tree Species on Tree Farm Licence 18.* Prepared for Slocan Forest Products Ltd. by J.S. Thrower & Associates Ltd. March 13, 2002;
- *Slocan Forest Products Ltd. TFL 18 Forest Cover Rectification and Update Project.* Prepared for Canadian Forest Products Ltd. By Silvatech Consulting Ltd. December 15, 2003;
- *Provincial Level Projection of the Current Mountain Pine Beetle Outbreak: An overview of the model (BCMPB) and draft results of year 1 of the Project.* Eng, M., A. Fall, J Hughes, T. Shore, B. Riel, P. Hall 2004. Canadian Forest Service;
- *Provincial Level Projection of the Current Mountain Pine Beetle Outbreak: An overview of the model (BCMPB v2) and results of year 2 of the project.* Eng, M., A. Fall, J. Hughes, T. Shore, B. Riel, P. Hall, A. Walton. 2005. Canadian Forest Service;
- *Selection and Mapping of Old Growth Management Areas (OGMA)—Clearwater Landscape Unit.* Prepared for Slocan Forest Products by Silvatech Consulting Ltd. 2003;
- *Guidance on Landscape- and Stand-level Structural Retention in Large-Scale Mountain Pine Beetle Salvage Operations.* Jim Snetsinger, Chief Forester, BCFS. December 2005;
- *Kamloops Land and Resource Management Plan.* Province of BC. As amended in March 1996 and August 2001, including the higher level plan order approved on January 31, 1996;
- *Province of British Columbia, Order of the Minister of Agriculture and Lands amending an order dated January 23, 1996 that declared the Kamloops Land and Resource Management Plan to be a Higher Level Plan*, January 31, 2006;

- *Clearwater Forest District Lakes Local Resource Use Plan – Lakeshore Management Guidelines.* August 1, 2001;
- Existing stand yield tables for TFL 18, accepted September 1, 2004;
- Managed stand yield tables and site index curves, accepted November 26, 2004;
- *Tree Farm Licence 18 Rationale for Allowable Annual Cut (AAC) Determination Effective October 25, 2000.* Larry Pedersen, Chief Forester. October 25, 2000;
- Letter from the Minister of Forests to the chief forester, dated July 28, 1994, stating the Crown's economic and social objectives for the province (see Appendix 3);
- Memorandum from the Minister of Forests to the chief forester, dated February 26, 1996, stating the Crown's economic and social objectives for the province regarding visual resources (see Appendix 4);
- *Forest and Range Practices Act*, 2002 and amendments;
- *Forest and Range Practices Regulations*, 2004 and amendments;
- *Forest Practices Code of British Columbia Act*, 1995, and amendments;
- *Forest Practices Code of British Columbia Act Regulations*, 1995, and amendments;
- *Bark Beetle Management Guidebook*, 1995, BCFS;
- *2004 Overview of Forest Health in the Southern Interior Forest Region.* Ministry of Forests, Maclauchlin, L., L. Rankin and K. Buxton;
- *2005 Overview of Forest Health in the Southern Interior Forest Region.* Ministry of Forests, Maclauchlin L., L. Rankin and K. Buxton;
- Summary of public input solicited by the licensee regarding the contents of the proposed Management Plan No. 10;
- Input received from First Nations through the consultation process consisting of information sharing initiated by the licensee as part of the review of proposed Management Plan No. 10, and consultation with the BCFS initiated in July 2005 regarding the timber supply review and AAC determination process;
- Technical information provided through correspondence and communication among staff from BCFS, the Ministry of Environment and Ministry of Agriculture and Lands;
- Review of TFL 18 operating conditions and the associated discussions among Canfor staff, the deputy chief forester and BCFS district, regional and branch staff on November 29, 2005;
- Consideration of factors required by Section 8 of the *Forest Act* for TFL 18 by the deputy chief forester with BCFS district, regional and branch staff at the AAC determination meeting held on December 21, 2005.

Documents and plans developed by Slocan Forest Products Ltd. are herein referenced under the current licensee's name "Canfor".

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the

major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with biophysical factors—such as the rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices.

However, the analytical techniques used to assess timber supply are necessarily simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variations in physical, biological and social conditions, although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide complete answers or solutions to forest management problems such as AAC determinations. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information required to be considered in AAC determinations.

In determining the AAC for TFL 18, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for timber supply areas (TSAs) and TFLs. Section 8 of the Act is reproduced in full as Appendix 1.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester, which include those required under Section 8 of the *Forest Act*.

Guiding principles for AAC determinations

The chief forester has expressed the importance of consistency of judgement in making AAC determinations. I also recognize the need for consistency of approach, and I am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 18.

Rapid changes in social values and in our understanding and management of complex forest ecosystems will affect our interpretation of the information used in AAC determinations or our weighing of it. In making the large number of periodic determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainties. To make my approach in these matters explicit, I have set out the following body of guiding principles. In any specific circumstance where I may consider it necessary to deviate from these principles, I will explain my reasoning in detail.

Two important ways of dealing with uncertainty are

(i) minimizing risk, in respect of which in making AAC determinations, I consider particular uncertainties associated with the information before me, and attempt to assess and address the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge -- a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I intend to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to *increase* the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to *reduce* the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia* – which is now in transition to the *Forest and Range Practices Act*.

In many areas, the timber supply implications of some legislative provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 18, as deputy chief forester, I have followed the same approach.

As British Columbia progresses toward completion of strategic land-use plans, in some cases the eventual timber supply impacts associated with the land-use decisions resulting from the various regional and sub-regional planning processes remain subject to some uncertainty before formal approval by government. In determining AACs, I will not speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government.

In some cases, even where government has made a formal land-use decision, it is not necessarily possible to analyze and account for the full timber supply impact in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, the establishment of resource management zones and resource management objectives and strategies for those zones. Until such implementation decisions are made it would be impossible to assess in full the overall impacts of land-use decisions. In such cases, the legislated requirement for frequent AAC reviews will ensure that future determinations address ongoing plan implementation decisions. Whenever specific protected areas have been designated by legislation or order-in-council, these areas are deducted from the timber harvesting land

base and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting resource management objectives such as biodiversity.

In TFL 18, government approved the Kamloops Land and Resource Management Plan (LRMP), and has established higher level plan objectives which were recently amended effective January 31, 2006. This has clarified many aspects of land and resource management and I refer to this where applicable in various components of this document.

When appropriate, I will consider information on the types and extent of planned and implemented intensive silviculture activities as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of their timber supply effects.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine many outdated AACs between 1992 and 1996. In any case, the data and models available today are superior to those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgement to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from decisions in recent years made by the Supreme Court of Canada. I am aware of the Crown's legal obligation to consult with First Nations regarding asserted rights and title in a manner proportional to the strength of their claimed interests and the degree to which the decision may impact these interests. In this regard, I will consider any information brought forward respecting First Nations' aboriginal interests, including operational plans that describe forest practices to address First Nations' interests. As I am able, within the scope of my authority under section 8 of the *Forest Act*, I address those interests. When aboriginal interests are raised that are outside of my jurisdiction, I will endeavour to forward these interests for consideration to other decision-makers.

The AAC that I determine should not be construed as limiting the Crown's obligations under the Court's decisions in any way, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 18. It is also independent of any decisions by the Minister of Forests and Range with respect to subsequent allocation of wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests and Range as set out in Section 4 of the *Ministry of Forests Act*, and of my responsibilities under the *Forest Act*, *Forest Practices Code of British Columbia Act* (the Code) and under the *Forest and Range Practices Act* (FRPA).

Because the new regulations of the *Forest and Range Practices Act* are designed to maintain the integrity of British Columbia's forest stewardship under responsible forest practices, it is not expected that the implementation of the legislative changes will significantly affect current timber supply projections made using the Code as a basis for the definition of current practice.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in this AAC determination, I am assisted by timber supply forecasts provided to me by the licensee as part of the BCFS Timber Supply Review program.

For each AAC determination a timber supply analysis is carried out using an information package including data and information from three categories: land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced. These include sensitivity analyses to assess the timber supply effects of uncertainties or changes in various assumptions around a baseline option, normally referred to as the 'base case' forecast.

The base case forecast may incorporate information about which there is some uncertainty. Its validity, as with all the other forecasts provided, depends on the reliability of the data and assumptions incorporated into the computer model used to generate it. Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

These adjustments are made on the basis of informed judgment, using current information available about forest management, which may well have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgments that may in part be based on uncertain information are essentially qualitative in nature and, as such, subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Timber supply analysis

The 2005 timber supply analysis for TFL 18 was prepared by Forest Ecosystem Solutions Ltd (FESL) under the direction of Canfor staff. FESL used its Forest Simulation and Optimization System (FSOS) model for the timber supply analysis. Based on my staff's experience examining results from this model, I am satisfied that it is capable of providing reasonable projections of timber supply.

The base case in the timber supply analysis incorporates a number of changes in input data and methodology from the base case generated in the previous timber supply analysis that supported the AAC determination effective October 25, 2000. The major changes that are leading to a higher projected harvest level include the use of:

- improved site index estimates for managed stands;
- custom yield table projections for residual balsam stands;
- standard operational adjustment factors;
- forest cover constraints for riparian management zones (rather than land base reductions); and
- inclusion of deciduous volumes in the timber supply.

Due to these and other changes, the current and previous base case projections are not directly comparable in some respects. Comprehensive details of the assumptions made in representing current forest management in TFL 18 in the base case are provided in the 2005 timber supply analysis report and many are also discussed in relevant sections of this rationale.

In the base case, the harvest flow objectives included maintaining the initial harvest level at the current AAC, or increasing it, for as many decades as possible, limiting changes in harvest levels per decade, and achieving a maximum even-flow long-term supply where the growing stock is stable. In light of the need for salvage of beetle-affected stands, the short-term harvest level assumed in the base case is higher than the medium-term harvest level.

The resulting base case forecast indicates that an initial harvest level of 237 000 cubic metres per year can be sustained for 15 years. This initial harvest level is considerably higher (by about 33 percent) than the current AAC of 177 650 cubic metres. The harvest level then decreases about 13 percent to a medium-term level of 205 500 cubic metres per year. The medium-term level can be maintained for 55 years before increasing eight percent by year 70 to a long-term harvest level of 222 000 cubic metres per year.

From my review of the timber supply analysis, including discussions with BCFS analysts, I am satisfied that the base case forecast provides a suitable basis of reference for use in my considerations in this determination. In addition to the base case forecast, I was provided with alternative harvest flows, and a number of sensitivity analyses carried out using the base case as a reference. Mountain pine beetle-related harvest flow scenarios were also provided. All of these analyses, and others as noted below, have been helpful in the considerations and reasoning leading to my determination, which are documented as follows.

Consideration of Factors as Required by Section 8 of the *Forest Act*

Section 8 (8)

In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area

Land base contributing to timber harvest

- general comments

The total area of TFL 18 is estimated to be 74 542 hectares. About 5834 hectares are considered non-forest and non-productive forest, an additional 12 hectares are non-commercial brush, and a net area of 1381 hectares is in existing roads. These deductions leave a total productive forest land area of 67 315 hectares within the TFL boundary.

About 3503 hectares (five percent) of the net Crown productive forest land area within the TFL was assumed in the base case to be unavailable for timber harvesting in the timber supply analysis. The current area estimated in the base case to be economically and environmentally suitable for harvesting—the 'timber harvesting land base' (THLB)—therefore covers 63 812 hectares (95 percent of the productive forest).

Forests within the areas excluded from the THLB do not contribute to timber supply but do contribute in the analysis to meeting a variety of non-timber resource objectives such as wildlife, visual quality and biodiversity.

Deriving the THLB includes making a series of deductions from the productive forest land area to account for factors that effectively reduce the suitability or availability for harvesting of the productive forest area for economic or ecological reasons. In timber supply analysis, assumptions, and if necessary, projections, must be made about these factors, prior to quantifying appropriate areas to be deducted from the productive forest area to derive the THLB. A detailed accounting of the areas deducted is given in the 2005 timber supply analysis (analysis). My consideration of these deductions follows. The "total area" deducted refers to the entire area of the factor deducted from the productive land base, while the "net area" refers to deductions made after accounting for other overlapping area exclusions.

- protected areas

Taweel Provincial Park, covering a total area of 282 hectares in the southern portion of the TFL, was excluded from the THLB in the base case. I accept this exclusion as appropriate given that the park has been formally designated.

- non-forest and non-productive forest, and non-commercial brush

A total area 5834 hectares of non-forest (including lakes, swamps and a variety of other on-forest types) and non-productive forest, and an additional net area of 12 hectares of non-commercial brush were excluded from the THLB in the base case. This represents the best available information from existing inventories which I accept as appropriate for use in this determination.

- roads

In the analysis, separate estimates were made to reflect exclusions from the THLB already incurred for existing roads trails and landings, and those to be expected in the future.

Exclusions from the THLB assumed in the analysis for existing roads were based on length of road by road class and the estimated width by road class that is considered unproductive. The unproductive widths by road class were based on a 2004 study for the TFL. For example, a degraded width of 24.9 metres was assumed for 35 kilometres of Class 1 road, while a width of 10.2 metres was assumed for 906 kilometres of Class 4 road. This led to an estimated total area of 1402 hectares of unproductive lands due to 1233 kilometres of existing Class 1 to 4 roads.

About 90 kilometres of additional Class 4 road and 9 kilometres of Class 3 road have been proposed by Canfor. As a consequence, a net area of 102 hectares is expected to be deducted from the current THLB in the future to account for proposed roads and this was accounted for in the base case.

In the base case an additional 526 hectares was deducted from the current THLB to account for future roads that have not yet been proposed. This was assessed by applying a 275-metre buffer around current roads, which represents average yarding distance, to delineate areas where future roads would be required. The average road length in recent cutblocks by road class was used to estimate future road requirements in areas without road access. In addition, a small reduction for future roads was applied within the buffer areas to account for additional access requirements.

The estimates for existing, proposed and future roads are based on a recent study and represent the best available information, and I accept their use as appropriate for this determination.

- riparian management

In the analysis, the recommended widths in the *Forest Practices Code Riparian Management Area Guidebook* were applied to existing streams, lakes and wetlands based on their estimate riparian class. This led to total reserve area of 1990 hectares (1052 hectares for streams, 147 hectares for lakes and 792 hectares for wetlands) which was excluded from the THLB.

To account for tree retention in riparian management zones in the base case, Canfor applied mature seral forest cover requirements. For stream classes S1 to S4, 50 percent of the stands within the riparian management zone had to be a minimum of 100 years of age during the forecast period. For all other riparian management areas 25 percent of the stands had to be a minimum of 100 years of age.

I accept these assumptions as appropriate procedures were used to account for this factor.

- unstable terrain

Terrain stability mapping has been completed in the TFL and this work was used in the analysis with a net area of 36 hectares deducted from the productive land base to account for Class V (unstable) terrain. The mapping also identified a total area of 935 hectares of Class IV (potentially unstable) terrain which Canfor maintains can be appropriately harvested. As a consequence, Class IV terrain was not deducted from the productive land base in deriving the THLB for the analysis.

BCFS staff believe that best available information and appropriate assumptions were used to account for unstable terrain in the base case. I concur and accept that this factor was appropriately modelled for this determination.

- permanent sample plots

In the analysis, a 50-metre buffer was applied to 64 growth and yield permanent sample plots in order to reflect current management practices around these plots. This resulted in a total area of 50 hectares and a net area of 45 hectares being deducted from the productive land base in the derivation of the THLB. I accept this deduction in support of this determination as appropriate.

- difficult regeneration

Environmentally sensitive areas (ESAs) classification from the forest cover inventory was used to identify areas with a high probability of regeneration failure. Canfor staff note that areas rated "high" represent extreme ecological conditions such as cold, high elevations, or rocky colluvial deposits and these areas are expected to have regeneration failures. As a consequence all of the 741 hectares classified as "high" were excluded from the THLB.

Canfor staff also concluded that sites rated as having 'moderate' regeneration difficulty could be harvested and successfully reforested through modified silvicultural practices. Consequently, none of these areas were excluded from the THLB.

Based on my review with BCFS staff, the best available information appears to have been used in the analysis. I accept that this factor was appropriately modelled in the base case.

- non-merchantable forest types

In the analysis, it was assumed that existing unmanaged stands that were not capable of attaining 125 cubic metres of volume per hectare within the 250 year harvest forecast period are non-merchantable. The Variable Density Yield Projection (VDYP) growth and yield model was used to project future volumes within existing unmanaged stands. The net area excluded from the THLB on this account was 38 hectares.

Canfor tested this merchantability assumption by assessing the volume profile within planned cutblocks. The lowest stand volume of any cutblock was 160 cubic metres per hectare. Based on past performance, Canfor staff believe stands with lower volumes per hectare can be harvested and that the 125 cubic metres per hectare limit is appropriate.

BCFS district staff raised concerns about the low volumes assumed in the analysis to be merchantable and I will discuss this later under *minimum harvestable ages*.

With respect to stands assumed to be non-merchantable, I accept that the analysis reasonably accounted for this factor for the purposes of this determination.

- *wildlife tree patches*

Management practices in TFL 18 since 1995 have included the retention of wildlife tree patches based on the advice provided in the *Biodiversity Guidebook*. The Ministry of Agriculture and Lands (MOAL) is scheduled to release new draft wildlife tree retention targets, which are substantially different than the Guidebook, for the Kamloops LRMP area (which includes the TFL). The intended new draft targets were used in the timber supply analysis to account for this factor based on methods set out by planning staff now with MOAL.

Draft targets were provided for each biogeoclimatic subzone in the Clearwater landscape unit within which the TFL resides, and these totaled 1430 hectares of wildlife tree retention. MOAL staff assume that about 48 percent of the target retention levels need to be provided in the THLB of the landscape unit, or 691 hectares. The percent of the TFL which occupies each subzone in the landscape unit is then used to determine the TFL target for wildlife tree retention within the land base. This led to a net additional exclusion of 496 hectares from the THLB in the analysis.

Although the draft targets have not been finalized, they now represent current practice in the TFL. However, there is some uncertainty about how the draft targets for the Clearwater landscape unit will be applied in the TFL, and also related to how to best model this retention in timber supply analysis. I encourage the licensee to update its assumptions in consultation with appropriate agency staff prior to the next determination. In the meantime, I am satisfied that the best available information was used to account for this factor in this determination.

Existing forest inventory

Vegetation Resource Inventory (VRI) is the current provincial standard for gathering new forest inventory information, however, this has not yet been undertaken for the TFL. A forest cover re-inventory was completed for TFL 18 in 1992 to BCFS standards at that time. The inventory was updated to the end of 2003 for harvesting and regeneration activities. The updated forest cover inventory was then projected to January 2004, for example, for age, height and volume, for use in the timber supply analysis.

The BCFS conducted an audit of the TFL's forest cover inventory in 1995. The audit found no statistical difference between timber volumes estimated from the inventory and those determined by audit ground samples.

Licensee staff recognized that major upgrades to the inventory were required and initiated a Forest Inventory Rectification Project in December 2002. One of the project tasks included improving the spatial accuracy of the inventory. As a consequence the inventory has been significantly improved since the last timber supply review and I find its use appropriate for this determination.

- volume estimates for existing unmanaged stands

In the timber supply analysis, estimates of timber volumes in existing unmanaged stands were projected using the Variable Density Yield Prediction (VDYP) model version 6.6d. Coniferous-leading stands greater than 40 years of age (i.e. established 1963 or earlier) and all deciduous-leading stands were assumed to be unmanaged stands. As previously discussed, the inventory audit found no significant difference between estimated stand volumes based on the inventory and audit samples.

Natural stand yield tables (NSYT) were developed using VDYP based on analysis units. Analysis units were developed considering site productivity, stand maturity and other factors. The NSYT were found acceptable for use in the timber supply analysis by inventory staff now with the BCFS.

BCFS district staff expressed concerns about some of the high volumes per hectare projected to be harvested in the base case, for example, stands with over 500 cubic metres per hectare of volume. Canfor reviewed cruise data and harvest block reports and indicated that both data sets show that stands with greater than 500 cubic metres per hectare do exist on the ground. However, BCFS staff are uncertain as to the extent of the high volumes stands in the TFL.

Unmanaged (natural) stand yields were modelled in the base case using standard procedures that were accepted by government. I therefore find their use appropriate in support of this determination. Under "Implementation", I request that Canfor monitor the high volume stands to confirm or revise the estimated extent of these stands in the TFL.

Expected rate of growth

- site productivity estimates

Inventory data include estimates of site productivity for each forest stand, expressed in terms of a site index. The site index is based on the stand's height as a function of its age. The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size.

The most accurate estimates of site productivity come from stands between 30 and 150 years of age. The growth history of stands less than 30 years of age is often not long enough to give accurate measurements of site productivity. Estimates derived from older stands underestimate site productivity as these stands are often well past the age of maximum height growth and have often been affected by disease, insects and top damage as they reach advanced age. The underestimate of site productivity based on forest inventory estimates for older stands have been verified in several studies (e.g. Old–Growth Site Index or OGSI study) in the province. These studies have confirmed that

when old stands are harvested and regenerated, site productivity realized is generally higher than what inventory-based site index estimates of older stands would predict.

In order to derive a better estimate of site productivity for existing and future regenerated managed stands, Canfor undertook a Site Index Adjustment (SIA) project and developed post-harvest Potential Site Indices (PSI). The yield tables used in the timber supply analysis for existing managed stands (i.e. coniferous-leading stands 40 years of age or younger) and future managed stands incorporate PSI, except stands located at elevations greater than 1550 metres where inventory-based site index was used. BCFS Research Branch staff accepted the site index adjustments for managed stands as suitable for use in the analysis.

A sensitivity analysis was performed to evaluate the use of inventory site index for managed stands rather than using PSI. Use of PSI in the base case has a substantial influence on both medium (about an 18 percent increase) and long-term harvest levels (about a 24 percent increase). PSI was not used in the last analysis and use of PSI partially explains the higher base case forecast in the current analysis.

In reviewing this factor, I am satisfied that the adjustments made to site productivity estimates were appropriate for use in timber supply analysis. Given the magnitude of the adjustment's effect on timber supply, under "Implementation", I request that the licensee monitor performance in managed stands to confirm or revise that the estimated gains in growth and yield are correct.

- volume estimates for regenerated managed stands

In the analysis, the standard BCFS growth and yield model Table Interpolation Program for Stand Yields or TIPSY (version 3.0h) was used to estimate the timber volumes for regenerated managed stands. The model was applied to all future regenerated stands and to all existing coniferous-leading stands 40 years old or less (i.e. established since 1963). Major inputs to the TIPSY model include species composition, regeneration delay, site index, operational adjustment factors and genetic worth of planting stock. The site productivity estimates previously discussed were used to provide site index.

The TIPSY projections are initially based on ideal conditions, assuming full site occupancy and the absence of pests, diseases and significant brush competition. However, certain operational conditions, such as a less-than-ideal distribution of trees, the presence of small non-productive areas, endemic pests and diseases, or age-dependent factors such as decay, waste and breakage, may cause yields to be reduced over time. Two operational adjustment factors (OAFs) are therefore applied to yields generated using TIPSY, to account for losses of timber volume resulting from these operational conditions. OAF 1 is designed to account for factors affecting the yield curve across all ages, including small stand openings, uneven tree distribution, endemic pests and other factors. OAF 2 accounts for factors whose impacts tend to increase over time such as decay, and waste and breakage.

In the previous analysis, localized OAFs were used. In preparation for the current analysis, Canfor found no documentation to justify continuing their use. As a result Canfor staff reviewed its operational conditions and found no reason not to use the standard provincial reductions.

In the current timber supply analysis for TFL 18 Canfor therefore used the standard provincial reductions of 15 percent for OAF1 and five percent for OAF2. These reductions were approved by the BCFS Research Branch in 2004.

The use of TIPSY with standard OAF reductions in the analysis reflects the use of best available information. As such, I accept how volume estimates for regenerated managed stands were factored into the base case.

- genetic worth

Use of select seed with improved genetic traits can increase timber volumes of managed stands in the long term and quicken the time for a stand to reach a green-up height or reach minimum harvestable age. The quantity and quality (genetic worth) of select seed available in the province has increased in the past decade, and is projected to increase further. Licensees are required to use select seed when available.

Canfor uses select seed and this use was reflected in the timber supply analysis in future managed stand yield tables. The genetic worth of select seed was prorated to reflect the amount of estimated ingress in each analysis unit. For example, the average genetic worth of lodgepole pine select seed represents a three percent volume gain in managed stands; if 50 percent of the stand is expected to have ingress due to natural regeneration, then a 1.5 percent volume gain was applied in the analysis.

In reviewing this factor with BCFS staff, I am satisfied that the analysis has reasonably accounted for the expected use of select seed.

- minimum harvestable ages

A minimum harvestable age is an estimate of the earliest age at which a forest stand has grown to a harvestable condition. The minimum harvestable age assumption mainly affects when second-growth stands will be available for harvest within the timber supply model. This, in turn, affects how quickly existing stands may be harvested such that a stable flow of timber harvest may be maintained. In practice, many forest stands will be harvested at much older ages than the minimum harvestable age, due to economic considerations or forest cover constraints on harvesting that arise from managing for such values as visual quality, wildlife and water quality.

Minimum harvestable ages assumed in the base case were based on the age at which stand volume reaches 125 cubic metres per hectare. As discussed in *non-merchantable forest types,* Canfor staff believe this minimum volume limit is appropriate considering past performance. In the harvest forecast, these low volumes are generally only harvested as a portion of the overall harvest during periods when available growing stocks are at a minimum (i.e. "pinch points" in timber supply) such as the transition period between harvesting natural and managed stands.

The actual age that each stand was estimated to reach a merchantable volume of 125 cubic metres per hectare varied considerably based on factors such as whether the stand is a natural or managed stand, and its site index.

BCFS district staff raised concerns about the low volumes assumed in the analysis. The resulting minimum ages to achieve these volumes are substantially below culmination of mean annual increment. Canfor assessed harvested stand volumes in harvest flows

projected in the analysis to determine the reliance on low-volume stands in sustaining the timber supply. The assessment showed that stands harvested in the model at 125 to 150 cubic metres per hectare averaged about 0.5 percent of the harvest profile for the first 70 years in the forecast and never exceeded 1.5 percent of the harvest. Canfor concluded that therefore the base case is not highly dependent on the harvest of stands with low volumes.

Although there is some uncertainty whether the low volume stands will be merchantable, I accept Canfor's conclusion that this appears to pose only small risk to timber supply as the model only utilizes the low volume stands during short-duration "pinch points" in the harvest forecast. The actual volumes and ages harvested in the model projections are generally considerably higher than the minimum allowed in the analysis and are on average close to culmination age which I find to be reasonable. I therefore accept the accounting for this factor for the purposes of this determination.

(ii) the expected time that it will take the forest to become re-established on the area following denudation:

Regeneration delay

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings.

Canfor assessed regeneration delay in the TFL based on silvicultural records between 1999 and 2003. It found that cutblocks planted with seedlings one year in age (1+0 stock) are considered regenerated after approximately two years after harvest. Accounting for the age of the planted seedling, this corresponds to a regeneration delay of one year. Cutblocks planted with two-year old seedlings (2+0 stock) are generally regenerated after approximately 1.5 years thereby resulting in no regeneration delay.

Cutblocks in the ESSF zone and the SBSmm variant are predominately planted with two-year old seedlings, while one-year old seedlings are more commonly used in other forest ecosystems following harvest. Canfor's assessment regarding the use of planting stock and resulting regeneration delay was reflected in the timber supply analysis.

BCFS district staff consider the regeneration delays assumed in the base case appropriate and I accept their use for this determination.

Not-satisfactorily-restocked areas

Not-satisfactorily-restocked (NSR) areas are those areas where timber has been removed, either by harvesting or by natural causes, and a stand of suitable trees and stocking has yet to be established. Where a suitable stand has not been regenerated and the site was harvested prior to 1987, the classification is 'backlog' NSR. All other NSR is considered 'current' NSR.

Canfor reports there is no backlog NSR in the TFL. The net current NSR area is 1520 hectares which equates well with the assumed regeneration delay given that this represents about three years of harvest (since about 500 hectares per year on average have been harvested in the TFL). NSR areas are regenerated in the analysis based on the regeneration delays previously discussed.

In reviewing this factor with BCFS staff, I am satisfied that NSR areas were appropriately modelled in the base case.

(iii) silvicultural treatments to be applied to the area:

Silvicultural systems

The silvicultural harvest systems predominately used on TFL 18 are clearcut with reserves and some small patch harvesting. The yield tables used in the timber supply analysis reflect this practice. I accept that the base case has appropriately accounted for this factor for the purposes of this determination.

Incremental silviculture

In general, incremental silviculture includes activities such as commercial thinning, juvenile spacing and fertilization that are not part of the basic silviculture obligations required to establish a free-growing forest stand following timber harvesting. Canfor is not currently undertaking nor has any plans for incremental silvicultural activities on the TFL, and none was assumed in the analysis. I am therefore satisfied that this factor was appropriately addressed in the base case.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area:

Utilization standards

Utilization standards define the species, dimensions and quality of trees that are harvested and removed from an area during harvesting operations. In the analysis, a 30-centimetre maximum stump height and 10-centimetre minimum top diameter was assumed for all species. In addition, for lodgepole pine, a 12.5 centimetre minimum diameter at breast height (DBH), and for all other species, a 17.5 centimetre DBH was assumed. These assumptions reflect current performance in the TFL and are standard utilization levels; most timber supply reviews in comparable TSAs and TFLs in the interior have adopted similar assumptions. I therefore am satisfied that utilization standards were appropriately modelled in the timber supply analysis.

Decay, waste and breakage

The VDYP model used in the timber supply analysis to project volumes for existing unmanaged stands incorporated estimates of volumes of wood lost to decay. Waste and breakage factors were applied in the analysis using the factors for the Forest Inventory Zone (FIZ) where the TFL is located. These estimates of losses have been developed for different areas of the province based on field samples. For TFL 18, special cruise — FIZ G are the default DW2B factors. Inventory staff now with the BCFS reviewed and accepted the use of these loss factors for existing unmanaged stands. As previously discussed, OAFs were used in the analysis to account for decay, waste and breakage in the yield tables for regenerated managed stands. I am satisfied that appropriate procedures were followed to account for decay, waste and breakage in the base case.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production:

Integrated resource management objectives

The Ministry of Forests and Range is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

The analysis for TFL 18 has addressed some IRM objectives through reductions in the THLB. I have accounted for these factors in 'Land base contributing to timber harvesting.' In this section, I account for IRM objectives where the land base continues to contribute to timber supply but various forest cover and adjacency constraints, or yield reductions are applied. I review in this section the assumptions made in the base case to account for these values. Some of these assumptions varied under the uplift scenarios and I discuss this later under *mountain pine beetle epidemic*.

- cutblock adjacency, forest cover and green-up

To manage for resources such as water, wildlife and visual quality, and to avoid concentrating harvesting-related disturbance in particular areas, operational practices limit the size and shape of cutblocks and maximum disturbances (areas covered by stands of less than a specified height), and prescribe minimum green-up heights required for regeneration on harvested areas before adjacent areas may be harvested. Adjacency, green-up and forest cover objectives guide harvesting practices to provide for a distribution of harvested areas and retained forest cover in a variety of age classes across the landscape.

In the analysis for TFL 18, in order to represent the desired conditions necessary to meet the various objectives in different areas consistent with the Kamloops LRMP, the TFL was zoned for different values such as visual quality, lakeshore management, old growth management areas and riparian management where varying forest cover requirements apply. These are discussed later for each of these values.

For the general IRM zone in the timber supply analysis, the licensee assumed no more than 33 percent of the stands can be less than three metres in height during the 300-year forecast period.

Having reviewed this information with BCFS staff, I am satisfied that the base case appropriately accounted for green-up and adjacency in the IRM zone.

- visual quality

The TFL 18 area falls outside the area currently identified as visually sensitive in the Kamloops LRMP. As a result scenic areas have not been established in the TFL. *According to the January 31, 2006 amendment* to the higher level plan order, landscape alterations from harvesting in areas outside the areas identified as visually sensitive in the Kamloops LRMP may dominate the characteristic landscape but must borrow from natural line and form to such an extent and on such a scale that they are compatible to natural occurrences. District staff indicate that much of the TFL is rolling terrain and achieving this objective is therefore not an issue.

Along with the requirements of the LRMP, Canfor recognizes 124 visual sensitivity units in the TFL which it manages consistent with *Procedures for Factoring Visual Quality Resources into Timber Supply Analysis* (BCFS 1998). This approach is reflected in the timber supply analysis. It includes identifying the visual absorption capability (VAC) and recommended visual quality class (RVQC) from the existing visual landscape inventory and then determining the percent allowable denudation. For example, in the base case a partial retention RVQC with a high VAC had a 15 percent denudation limit but in a low VAC area the denudation was limited to 5.1 percent.

Areas within the visual sensitivity units are no longer considered denuded when visually effective green-up (VEG) height is achieved. VEG height varies depending on the average slope of the unit. For example, in the base case on slopes between 11 to 20 percent, VEG height was assumed to be 4 metres, while on steep slopes between 51 to 60 percent, VEG height was considered to be 8 metres.

The Headwaters Forest District is currently undertaking a review of the visual inventory within the district including the TFL. The Integrated Land Management Bureau of the Ministry of Agriculture and Lands is working with the BCFS to amend the boundaries of the area identified in the Kamloops LRMP as visually sensitive to reflect the findings of this review. District staff expect that the area requiring management for visual resources on TFL 18 will be smaller than assumed in the base case.

Canfor provided a sensitivity analysis to assess the impact of removing all visual management constraints assumed in the base case. This resulted in no change in the short-term harvest level, but did increase the medium-term harvest level by 16 500 cubic metres per year and the long-term harvest level by 15 000 cubic metres per year. This suggests that uncertainty with respect to future management of visually sensitive areas may represent a small increase in timber supply in the medium to long-term.

Since no decision has yet been made on the extent of the area requiring management for visual resources on TFL 18, I am satisfied that the base case reflects current management in this respect and make no adjustments on this account for this determination. I will further discuss management for visual resources below under *lakeshore management*.

- identified wildlife

The province's Identified Wildlife Management Strategy (IWMS) addresses plant communities and species at risk (e.g. red and blue listed species), and regionally significant species. "Identified wildlife" are those wildlife species and plant communities

that have been established as requiring special management. Identified wildlife can be protected through the establishment of wildlife habitat areas (WHAs) with objectives or general wildlife measures. The objectives or general wildlife measures may preclude or constrain timber harvesting activity depending on the requirements of individual identified wildlife species or communities.

Government policy direction limits the timber supply impact of the IWMS to one percent. Operational policy has been to initially allocate the one-percent impact equally to each forest district with acknowledgement that this approach can be refined if warranted. Impacts greater than one percent can still be addressed by government if required to protect species at risk, but using other tools such as land use decisions.

No WHAs have been established, and currently none are planned by the Ministry of Environment (MOE) in the TFL. Should there be a need to protect identified wildlife, Canfor staff believe the habitat requirements can be met through the location of old growth management areas and wildlife tree patches. Consequently, no accounting for identified wildlife was made in the timber supply analysis.

For the purposes of this determination, I am satisfied that this factor was adequately addressed in the base case. If future decisions are made by government regarding the management of identified wildlife and species at risk that result in impacts on timber supply that are different than those assumed in the base case, this can be accounted for in subsequent determinations.

- wildlife considerations

The Kamloops LRMP provides direction for the management of wildlife. Other than moose, there are no other regionally important species identified as needing management in the TFL. The LRMP recognizes 2126 hectares of critical moose winter range in the lower Mann Creek watershed portion of the TFL. The draft old growth management area (OGMA) (see below) in the watershed is expected to address the forest cover requirements for moose in the winter range. Visual screening may be more important to moose management than thermal cover. The Kamloops LRMP requires visual screening, such as along roads and cutblocks, but no land base reduction or constraint is needed to account for this operational practice in timber supply analysis.

Canfor manages locally important species such as the northern goshawk and mule deer on a site specific basis and no forest cover constraints are modelled in the analysis.

BCFS staff believe that the timber supply analysis reflects LRMP direction for wildlife. I am therefore satisfied that the assumptions used in the base case to account for wildlife habitat is appropriate for use in this determination.

- watershed considerations

There are no longer any community watersheds in the TFL now that the Gill Creek watershed has been deregistered. BCFS district staff are reviewing the status of all watersheds in the TFL; at this time, no new direction for watershed management is expected. Canfor has set up equivalent clearcut area (ECA) objectives for all watersheds for monitoring purposes. ECAs are essentially the proportion of the watershed that has been harvested with a reduction factor applied to account for the hydrologic recovery as

harvested areas regenerate. Canfor uses ECA percent thresholds per watershed (generally between 30 and 35 percent) as a "red flag" to assess if operational practices are impacting the watershed. ECA thresholds per se do not constrain forest development and were therefore not used in the analysis to constrain timber supply.

With Canfor's proposed AAC of approximately 325 000 cubic metres, in the short-term ECA thresholds are forecasted to be exceeded for a number of watersheds for portions of the harvest forecast. With the increased harvest level, BCFS district staff may provide future operational guidance to Canfor given these forecasted impacts.

In the meantime, BCFS staff believe the base case adequately accounted for this factor for the purposes of this determination, and I concur with this assessment.

- lakeshore management

The Lakes Local Resource Use Plan includes lakeshore management guidelines that were provided in 2001 and these apply to TFL 18. The plan addresses practices within the 200-metre lakeshore management zone. Practices vary depending on the class of the lake and the resource being managed (e.g. visual quality within the 200-metre zone). The guidelines include recommendations for selection harvesting and clearcutting including basal area retention, maximum cutblock size and the maximum area allowed to be harvested during each harvest pass.

Since selection harvesting is not currently practiced in the TFL, the guidelines for clearcutting were applied in the timber supply analysis. Canfor assumed the specified maximum allowable harvest per pass applies to the productive forest. It further assumed that a harvest pass spanned the time for regeneration within an area to reach three metres height. For class B, C, D and E lakes, the maximum allowable harvest per pass was modelled as 20, 25, 40 and 50 percent respectively of each lakeshore management zone.

The guideline for class A lakes excludes harvesting except for the management of health, pests, disease, fire and other natural occurrences that threaten the integrity of the adjacent commercial stands and/or recreation/safety. For the analysis, Canfor assumed that ten percent of stands in the lakeshore management zone for class A lakes that are susceptible to attack by the mountain pine beetle can be harvested. District staff note that a ten percent allowable harvest should not be assumed for all class A lakes. The net area of class A lakeshore management zones in the THLB is 287 hectares, which is less than 0.5 percent, so uncertainty in this aspect of the analysis represents a very small to negligible impact on timber supply.

Visual quality in lakeshore management zones was modelled similar to the visual sensitivity units described above under *visual quality* except that VAC was always rated as moderate. The assumed visual quality objectives (VQO) were preservation for class A lakes, retention for class B, partial retention for class C, and modification for class D and E lakes — while some lakes had a 'no harvest' objective. The mid-range with respect to percent allowable alteration was used for each assumed VQO in the lakeshore management zones in the base case.

The timber supply analysis used the more restrictive forest cover constraint where more than one applies to the lakeshore management zone (e.g. maximum harvest area and VQO for a specified class of lake).

Other than the assumptions regarding class A lakes, BCFS staff believe that the methods and assumptions used to model the guidelines and visual quality objectives for lakeshore management zones in the timber supply analysis were appropriate. Given the very small to negligible impact associated with uncertainty in the ten percent harvest assumption for class A lakes used in the analysis, I do not believe any adjustments are needed to account for this factor for the purposes of this determination.

- old growth management areas

Old forest retention is a key consideration in the conservation of landscape-level biodiversity. The TFL is located within Clearwater landscape unit which was assigned a low biodiversity emphasis option through the Kamloops LRMP process. Old forest retention targets are associated with different biodiversity emphasis options. The licensee led the development of draft old growth management areas (OGMAs) in the Clearwater landscape unit in 2003 in order to address old forest retention. These draft OGMAs were used in the timber supply analysis.

OGMAs are managed as permanent reserves within the TFL in that their location is fixed throughout the base case harvest forecast. In the analysis, limited harvesting (up-to-ten percent of the draft OGMA) was modelled in order to address forest health/protection concerns. Canfor further assumed that at least 90 percent of the productive forest needs to be greater than 120 years or 140 years of age, depending on the biogeoclimatic variant within which the OGMA lies. The age definition used for old seral forests is consistent with the OGMA process agreement developed for the Kamloops LRMP area.

MOAL staff reviewed Canfor's assumptions and do not believe the up-to-ten percent harvesting assumed in OGMAs is appropriate. Although provincial policy for the management of OGMAs is not released, the policy is expected to only allow for harvesting for forest health purposes where it is needed to protect the OGMA or the surrounding land base. The magnitude of the mountain pine beetle epidemic in the TFL suggests that any salvage harvesting in OGMAs would not assist beetle control and therefore is not likely to be compatible with the expected policy. If beetles do attack trees within the OGMA, the dead pine may still be suitable for biodiversity purposes.

Canfor undertook a sensitivity analysis where no harvesting was allowed in OGMAs. The analysis indicates no impact on the base case harvest level in the short term, but does decrease the medium and long-term harvest levels by about one percent (i.e. 2000 and 3000 cubic metres, respectively).

I acknowledge that it is unlikely that harvesting will be conducted in OGMAs. However, the potential consequences of this assumption, based on the sensitivity analysis, suggests no impact on the short-term harvest level assumed in the base case and minor (about one percent) impacts in the medium to long-term. This impact is sufficiently small that there is no need for me to adjust the determination to better account for this factor.

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber;

Other information

- harvest sequencing

In timber supply analysis, the order in which eligible stands are assumed to be harvested can affect the projected timber supply in a number of ways. Any difference between the modelling assumptions made and the order in which stands are actually harvested in operational practice must be examined and accounted for.

In the base case for TFL 18, harvesting of approved cutblocks in cutting permits and forest development plans initially proceeds. Then the harvest is directed over the first five years to the salvage of beetle-attacked stands and windthrow. The focus of years six to 15 is on the harvest of stands expected to be attacked by the mountain pine beetle. After 15 years, when salvage of pine-beetle killed stands is expected to be over, forest stands that are growing most slowly relative to the stand that they will regenerate to after harvest are harvested first. This "relative poorest first" harvest rule gave no particular focus on species profile.

The focus of recent harvesting has been on lodgepole pine-leading stands that have been infested or are susceptible to infestation by the mountain pine beetle populations. This is also expected to be the focus of harvesting over the next several years. This issue is addressed under *mountain pine beetle epidemic* where scenarios are explored that do target pine-leading stands.

- twenty-year plan

Canfor prepared a twenty-year plan in support of the draft MP No. 10 document for TFL 18. The plan was submitted in February 2005 and accepted by the BCFS district manager in May 2005. This spatial analysis sets out a hypothetical sequence of harvesting over a 20-year period using the assumptions that supported the base case. All approved blocks from existing forest development plans are used in the harvest scheduling assignments. The spatial analysis is not intended to be an operational plan but does demonstrate that harvest blocks can be identified that achieve base case harvest levels for the first 20 years.

- residual balsam stands

TFL 18 contains significant areas of residual balsam stands resulting from historic intermediate utilization (IU) logging. During the 1940s through 1960s, timber harvesting activities incorporated IU standards, whereby smaller, undesirable species and stems less than a specific diameter were left, leaving residual stands composed largely of smaller diameter and suppressed balsam and spruce stems. At the time, it was generally assumed that the areas would fill in naturally with coniferous species, and that the regeneration, in combination with growth of the residual stand would develop into a merchantable future crop.

Residual balsam stands cover about 12.5 percent of the productive forest in the TFL. Because of uncertainty in future volume projections, site productivity and

merchantability of these stands, the chief forester in the October 2000 AAC determination requested that the licensee further investigate the growth and yield and stand dynamics of residual balsam stands.

Canfor contracted a study in 2003 to perform a growth and yield assessment on residual balsam stands. The study culminated in the development of custom yield tables for these residual stands in 2004 which were used in the timber supply analysis. The findings of the study included revised estimates for site index of the residual balsam stands which are 26 percent greater than indicated in the inventory. In addition, the net merchantable volume was found to be 35 percent higher than estimated using the inventory – with most stands exceeding 125 cubic metres per hectare (i.e. the assumed minimum volume used in the analysis to determine merchantability and *minimum harvestable ages*). The study found that current annual stand volume growth is about four cubic metres per hectare.

BCFS staff note that there is little operational performance in these residual stands. These stands are heavily relied on in the analysis to support harvest levels in the medium term, particularly with a sizeable increase in the AAC to respond the mountain pine beetle.

Canfor provided a sensitivity analysis where no more than 25 percent of the harvest could be derived from residual balsam stands. The results showed that the base case could be achieved with an average harvest of 14 percent of residual balsam stands over a 55 year period. However, these results are predicated on the higher expected growth and yield from these stands based on the 2003-04 study.

Another sensitivity analysis therefore assessed the impact on base case harvest flows if inventory generated volume curves (using VDYP) were used instead of the higher custom yield tables emanating from the 2003-04 study. These results show no effect on short- or long-term timber supply, but do result in a drop in medium-term harvest levels relative to the base case to about 190 000 cubic metres (about seven percent below the base case).

Inventory staff now with the BCFS accepted the custom natural stand yield tables for use in the timber supply analysis in September 2004 with consideration that a ten percent volume over-prediction may have occurred. Given the limitations of the VDYP model, the inventory data, and the complex nature of the IU balsam stands, inventory staff accepted the current information provided in the study as representing the best available information.

In reviewing this factor with BCFS staff, I acknowledge the important follow-up work that Canfor commissioned in response to the chief forester's request from the last determination. I concur with inventory staff that this new information represents the best available information to determine growth and yield and existing volumes on residual balsam stands in the TFL and I therefore accept their use for this determination.

At the same time, I acknowledge that any uncertainty in this factor can pose a significant risk given the reliance in the model on these stands in the mid-term. More field data to further monitor and validate the growth and yield of these stands is needed to reduce this uncertainty. As a consequence, under "Implementation" I request the licensee continue to improve the estimates regarding existing stand volumes and growth and yield for these

stands. Future AAC determinations need to be supported by monitoring and improving yield information for these residual balsam stands.

- Kamloops Land and Resource Management Plan

Strategic plans such as the Kamloops LRMP provide context and direction for forest operational planning by providing objectives for the management of various forest resources. The Kamloops LRMP was approved in 1995. As a 'living plan', the LRMP was amended in 1996 and more recently in 2001. The Kamloops LRMP provides objectives and strategies for the entire LRMP area as well as additional objectives and strategies that are specific to each mapped resource management zone. Implementation of the plan is enabled through various legal tools and through the recommendations and guidance it provides. A Kamloops LRMP monitoring report was completed in 1999 which assessed achievement of desired outcomes in the plan after five years of implementation.

I recognize that the Minister of Agriculture and Lands has recently amended the existing higher level plan order that applies to the Kamloops LRMP by identifying the specific resource management zones and objectives that are currently in effect for purposes of operational planning during FRPA implementation. I am also aware that the Kamloops LRMP will continue as a government land use planning policy document and that agencies and licensees intend to continue to follow the spirit and intent of the LRMP until such time as it is formally updated.

I am also aware that current practices in the TFL are guided by the recommendations arising from the Kamloops LRMP, and that these recommendations were used in the development of the timber supply analysis. I have discussed this in the various factors described in this document and am satisfied that the direction in the Kamloops LRMP is satisfactorily reflected in the base case that I am considering in support of this determination.

- First Nations considerations, and archaeological and cultural heritage values

The two First Nations who have asserted traditional territories within the TFL, the Simpcw First Nation and the Canim Lake Indian Band, were contacted several times by Canfor and the BCFS to encourage review and comment on both the TFL MP and the timber supply analysis. In June 2004, Canfor provided First Nations with a letter and draft MP No. 10 documents asking for their comment; a follow-up letter was sent in August 2004. The verbal feedback from Simpcw First Nation was that they had no comments other than they do not recognize the MP as being consistent with their rights/title claims. Canfor met with Simpcw First Nation's representatives in June 2005 and mentioned that the final MP would be submitted in July 2005 and that they would receive a copy. Canfor sent the MP and the timber supply analysis package to the two First Nations in July 2005 for their review.

BCFS district staff contacted the two First Nations in July 2005 reminding them of the MP and analysis package that they had received from the licensee and gave an invitation to meet with them and Canfor and/or submit written comments. The acting BCFS district manager sent a follow-up letter to the two First Nations in August 2005 with an invitation

for the bands to meet with BCFS staff and to send written comments. In November 2005, BCFS staff called the First Nations to see if they wanted to respond. Another follow-up letter was sent in December 2005, indicating that an AAC decision was pending and asking that the First Nations provide information to Canfor or the BCFS about their aboriginal interests and how these might be affected by the AAC determination.

Both First Nations contacted are member nations of the Shuswap Nation Tribal Council and on January 4, 2006 the Tribal Council sent a letter to Canfor responding to the December 2005 letter from the BCFS. In the letter the council described recent court cases that concerned aboriginal title and rights and the obligation of government to consult with First Nations with respect to third party development activities on Crown lands. It indicated that it believes the provincial government's consultation framework, land use referral policy and administrative system is inadequate to deal with its interests in the land and resources within its traditional territory or to meet the fiduciary obligations of British Columbia.

On February 3, 2006 Headwaters District staff met with the Simpcw First Nation to discuss various forestry-related issues including the AAC determination for TFL 18. The Simpcw First Nation indicated it is concerned about the liquidation of pine and asked what the licensee's plans are for retention. BCFS staff confirmed that there will be an emphasis on harvesting pine and that the licensee would have to comply with legal direction regarding retention of forest to conserve values other than timber. BCFS staff asked if there were any further questions or issues related to the MP No. 10 or the AAC determination for TFL 18. No further issues were identified.

Information sources that relate to archaeological and cultural heritage values that may be associated with the TFL include the Simpcw Traditional Use Study (TUS) and the Archaeological Overview Assessment (AOA) process in the Kamloops LRMP area including the TFL. In addition, I note that archaeological and cultural heritage values are protected through the *Heritage Conservation Act.* A TUS which overlaps with the TFL exists for the Canim Lake band. BCFS district staff are not aware of any archaeological sites or contentious areas from a First Nations perspective in the TFL area. Based on the AOA, the probability of finding archaeological sites in the TFL appears to be low.

Canfor notes that there have been no significant modifications to harvesting areas due to cultural heritage values. The licensee believes that where these values are found, they can be accommodated through the deployment of other reserves and the placement of wildlife tree patches. As a consequence, the timber supply analysis includes no specific additional land base reductions or constraints for archaeological or cultural heritage values.

Forest and Range Opportunities (FROs) are interim agreements between BCFS and eligible First Nations. They are designed to provide for workable accommodation of aboriginal interests that may be impacted by forestry decisions during the term of the agreement, until such time as those interests are resolved through treaty or other processes. FROs may provide First Nations with a directly awarded forest tenure or a share of forestry revenues or both. BCFS staff are actively negotiating with the Simpcw and Canim Lake bands with the objective of finalizing a FRO and/or similar accommodation agreement.

In reviewing this factor with BCFS staff, I am satisfied that BCFS staff have made reasonable efforts to identify the aboriginal interests of the First Nations with asserted traditional territories covering all or parts of TFL 18. I believe the timber supply analysis has appropriately accounted for First Nations considerations, and archaeological and cultural heritage values. If issues are identified that significantly vary from the assumptions made in this determination, this can be addressed when the AAC is re-determined which must take place within five years of this determination.

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area;

- Alternative harvest flows

The nature of the transition from harvesting old growth to harvesting second growth is a major consideration in determining AACs in many parts of the province. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be regularly determined to ensure that short-term harvest levels are compatible with a smooth transition to medium and long-term levels. Timber supplies need to remain sufficiently stable so that there are no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

In the base case, the harvest flow objectives included maintaining or increasing the current AAC for as many decades as possible, limiting changes in harvest levels per decade, and achieving a maximum even-flow long-term supply where the growing stock is stable. In light of the need for salvage of beetle-affected stands, the short term in the base case is higher than the medium-term harvest level and all levels are greater than the current AAC.

Canfor provided alternative harvest flows. One examined the highest initial harvest with a non-declining harvest flow. This initial harvest was assessed to be 211 000 cubic metres per year (approximately 19 percent above the current AAC) before eventually increasing to a long-term harvest level of 222 000 cubic metres.

Another harvest flow tested the impact of increasing the initial harvest level to 267 000 cubic metres per year (about 50 percent greater than the current AAC) for 15 years. Relative to the base case, this caused about a 5000 cubic metre reduction in the medium-term harvest level (to about 200 000 cubic metres per year) but had no impact on the long-term harvest level.

I have considered the base case forecast and these alternative harvest flows in my determination, particularly given the mountain pine beetle epidemic confronting timber supply in the TFL.

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities;

This section of the *Forest Act* was repealed in 2003. [2003-31-2 (B.C. Reg. 401/2003)]

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia;

Minister's letter and memorandum

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994 (attached as Appendix 3) and a memorandum dated February 26, 1996 (attached as Appendix 4).

This letter and memorandum provide a government view on forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest-level changes in a managed transition from old-growth to second-growth forests, so as to provide for community stability.

The Minister stated in his letter of July 28, 1994, that 'any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.' He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas in order to help maintain harvest levels. To encourage this, the Minister suggested consideration of partitioned AACs.

I reviewed commercial thinning under *incremental silviculture* and note that commercial thinning is not being undertaken in the TFL nor is assumed in the timber supply analysis. I have reviewed the land base assumptions in the timber supply analysis under *Land base contributing to timber supply*; the TFL is highly operable relative to many other management units in the province. I am satisfied that assumptions made that define uneconomical areas is based on the best information currently available. The timber supply analysis demonstrates that short-term harvest levels can exceed the current AAC without commercial thinning or harvesting in previously uneconomic areas. Given this information, I see no helpful reason to establish specific harvest levels attributable to particular areas, species, or terrains (i.e. partition) in this TFL at this time to address commercial thinning and previously uneconomic areas.

Canfor's Vavenby Division is the major employer in the Upper North Thompson Valley, with mill production of 250 million foot board measure (fbm) per year and with direct employment of 260 full-time employees and indirect employment of 130 contract employees. Canfor has adopted a niche market strategy for this Division, and maintaining an input mix of pine, spruce and first logs is considered important to the company in order to achieve its product mix for the market. Two forest tenures are held by Canfor-Vavenby, Forest License A18688 (with an AAC of 209 638 cubic metres) and TFL 18 (with a current AAC of 177 650 cubic metres), and the remaining volume to meet mill consumption is purchased. With a preponderance of pine on the market, the company reported the need to maintain an adequate level of non-pine logs from its TFL

in order to maintain the product mix. This is a factor which must be borne in mind when assessing the company's performance in relation to pine harvesting. Canfor's need for a mix of tree species can be facilitated through the non-pine component of pine leading stands, as well as through spruce beetle and windthrow salvage.

The Minister's memorandum addressed the effects of visual resource management on timber supply, asking that the constraints applied to timber supply to meet VQOs not be allowed to unreasonably restrict timber supply. As noted in *visual quality*, the analysis addressed the timber supply impacts from visual sensitivity units currently being managed by Canfor, and VQOs in lakeshore management zones, consistent with the direction provided in the Kamloops LRMP and Lakes Local Resource Use Plan. I am therefore satisfied this approach addresses the objectives expressed by the minister.

Local objectives

The Minister's letter of July 28, 1994, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives.

Local objectives for land and resource use in TFL 18 are largely captured in the Cabinet approved Kamloops LRMP. I have accounted for these objectives as they relate to various factors that I have considered in my determination. Local objectives related to lakes are provided in the Lakes Local Resource Use Plan (LRUP) and I account for this under *lakeshore management*.

District staff shared with me the consultation process with First Nations that I discussed earlier under *First Nations considerations, and archaeological and cultural heritage resources*. I have taken this process and feedback into account in my determination.

Draft MP No. 10 was advertised in 2004 for public review and comment in two editions of the North Thompson Times. A referral letter was also sent to 36 individuals representing other stakeholder and tenure interests, First Nations (as discussed) and agency staff. The draft plan and associated timber supply analysis information package were made available for review at Canfor's office in Vavenby and at the Headwaters Forest District office. No public input comments, other than from First Nations, were received during the comment period.

Based on this, I believe my accounting for objectives provided in the LRMP and LRUP, along with First Nations consideration, which I address elsewhere in this rationale appropriately address the Minister's request that I consider local objectives.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Forest health

Several biotic and abiotic factors can affect forest health. Forest stands are susceptible to a variety of damaging agents including wildfires, windthrow, disease and insects. Timber volume losses due to insects and diseases that normally affect stands (endemic losses) are generally measured and accounted for in the forest inventory and growth and yield estimates. Volumes lost due to abnormal events (epidemic losses) are addressed below under *unsalvaged losses*.

A major insect of current concern on the TFL other than the mountain pine beetle, which I discuss later, is the spruce bark beetle. The spruce beetle is the most destructive pest of mature spruce trees in BC and 30 percent of the volume by species in the THLB in the TFL is spruce (in comparison, 25 percent is pine). As noted in the *Bark Beetle Management Guidebook*, outbreaks are generally short-lived and usually originate from unsalvaged windthrow of mature spruce and then spread to kill large numbers of apparently healthy trees over extensive areas. Ground-level information is needed to determine at what stage in the two to five year cycle the beetle populations are at locally since aerial detection is difficult. For example, the needles on the trees often remain green for some time following attack before turning brown. Canfor has responsibilities on the TFL to monitor and address the spruce beetle.

In an effort to avert an epidemic outbreak of the spruce beetle and to reduce unsalvaged losses, the licensee aggressively harvests windthrow and infested spruce. The licensee salvaged 197 578 cubic metres of susceptible and infested spruce bark beetle stands between 1999 and 2003 thereby averaging about 40 000 cubic metres per year. In comparison, the mountain pine beetle salvage efforts were just starting in 2003 with 16 451 cubic metres of susceptible and infested volumes harvested.

About 77 percent of the mature timber volume affected by fires are reported to be salvaged on average between 1979 and 2003.

In addition to the need to address salvage harvesting for mountain pine beetle which I discuss later, I recognize in my "Reasons for Decision" the need to salvage 40 000 cubic metres per year on average of spruce bark beetle attacked stands based on recent harvesting history. The other salvageable losses, from the Douglas-fir beetle and the western balsam bark beetle, are not sufficiently high on their own to require them to be separately accounted for in my decision; they can be reasonably addressed within my determination. To better account for the spruce bark beetle in the next determination, under "Implementation" I request that the licensee undertake the needed ground surveys to determine the status of the population and thus its risk to timber supply.

Unsalvaged losses

Unsalvaged losses are timber volumes destroyed or damaged, by such agents as fire or pests, that are not either recovered through salvage operations, accounted for in growth and yield estimates, or in the inventory. The licensee is well positioned to salvage many significant losses stemming from biotic and abiotic forest health factors given that the TFL has an extensive road network and highly operable terrain. Canfor estimates that approximately 95 percent of the potential losses within the THLB are salvaged (see *Forest health* above).

In the base case, the licensee assumed annual unsalvaged losses of 3000 cubic metres per year based on an estimate of recent averages. This represents 5 percent of the five-year average salvage volume of bark beetles and windthrow (i.e. about 2700 cubic metres per year), and approximately 300 cubic metres per year to account for unsalvaged losses due to fire. This loss estimate was subtracted from the total harvest forecast.

Additional potential unsalvaged losses due to the *mountain pine beetle epidemic* are discussed below. With respect to non-mountain pine beetle losses, I am not aware of any better information to refine the estimates provided in the analysis for unsalvaged losses and therefore accept their use in timber supply analysis as a reasonable basis for making this determination.

Mountain pine beetle epidemic

Mountain pine beetles are part of the natural process in lodgepole pine ecosystems. However, the current provincial outbreak has reached an unprecedented level in BC's history of recording such events. The 2005 aerial survey indicates 8.5 million hectares of the province are affected by the outbreak; this has increased substantially from the seven million hectares affected in 2004. The 2005 aerial survey indicated about 4.7 million hectares were affected in the Southern Interior Forest Region with close to 100 000 hectares in the Headwaters Forest District which includes TFL 18. An immediate collapse of the beetle infestation does not appear likely since the recent trend of warm winters is expected to continue. In 2005, BCFS staff projected that by 2006, 50 percent of the merchantable lodgepole pine volume in BC's interior would be affected. Preliminary results from the overview survey conducted in the fall of 2005 indicate that the outbreak is progressing more rapidly than previously thought. This huge pine mortality affects available timber supply and habitat, and associated economic and environmental values.

In 2004, Canfor was managing small outbreaks of mountain pine beetle on TFL 18 through salvage harvests within the current AAC. While outbreaks have been relatively small, approximately 28 percent of the growing stock on the TFL is lodgepole pine found mainly within mixed stands.

In the timber supply analysis, highly susceptible stands are assumed to be stands containing over 60 percent mature pine older than 80 years of age. These stands cover 7586 hectares (about 12 percent) of the THLB, and comprise 2.57 million cubic metres which is about 20 percent of total volume on the THLB. Moderately susceptible stands are assumed to be those with 40 to 60 percent mature pine older than 80 years. These stands represent about five percent of the THLB by area (3076 hectares) and about nine percent of the total volume (1.1 million cubic metres) on the THLB.

Because of the recent increase in mountain pine beetle in the TFL, harvesting has increasingly focused on the salvage of infested or highly susceptible stands. In 2002, prior to the epidemic's dramatic spread in the TFL, no harvesting was focused on salvage or susceptible stands, while in 2003 nearly 30 percent of the area harvested consisted of these stands, and in 2004 over 50 percent. Most of the harvesting in 2004 was directed at salvaging mountain pine beetle and spruce beetle affected stands or on highly susceptible stands. The focus on these stands is expected to increase even further with an increase in the AAC.

Given the rapidly expanding mountain pine beetle population and the apparent stability of the mid-term harvest projections within the TFL, Canfor developed the base case in 2004 with an increase in the short-term harvest level to 237 000 cubic metres per year. The objective of the increase was to allow for the harvest of stands containing dead pine

and the most susceptible stands (i.e. highly and moderately susceptible) in the short term (i.e. for the first 15 years). Given the extent and expected spread of the infestation in 2004 and this objective, Canfor applied no additional assumptions such as shelf-life for recovering economic volume from infested pine stands.

After the spring surveys of 2005, Canfor noted greater than expected levels of mountain pine beetle and proposed a revised increase 264 500 cubic metres per year to harvest dead and highly susceptible stands (i.e. with more than 60 percent mature pine). Canfor modified the assumptions in base case to include assumptions such as shelf-life, stand dynamics and regeneration in a revised mountain pine beetle uplift analysis ("revised MPB analysis").

The fall 2005 provincial aerial survey of mountain pine beetle infested stands showed even higher levels of infestation in the TFL than expected. The higher levels of mortality prompted Canfor to increase its proposed harvest level to 325 000 cubic metres per year.

In the revised MPB analysis, three sets of assumptions were provided (i.e. optimistic, conservative and pessimistic) for each type or category of assumption (i.e. susceptibility, mortality, current state, duration, shelf-life, stand dynamics and regeneration age).

The conservative (or mid-point) set of assumptions in the revised MPB analysis included the following:

- lodgepole pine trees susceptible to attack were considered to be over 60 years of age in stands with over 10 percent pine volume,
- 70 percent of pine volume in susceptible stands would be killed;
- currently, about five percent of the pine volume is dead;
- the attack would end in 2008 in the TFL;
- there would be no loss in merchantable pine volume for three years after attack and then a linear decrease in volume would occur until 13 years after attack;
- attacked pine volume is removed from yield tables with no yield recovery after attack; and
- unharvested stands with greater than 60 percent pine break up naturally after shelf-life and regenerate to the same natural stand yield tables (using VDYP) following a 20-year regeneration delay.

In the revised MPB analysis, recommended visual quality classes in visual sensitivity units were relaxed and assumed to be modification in the short-term. The assumed visual quality objectives in lakeshore management zones remained unchanged; however the highest allowable percent alteration within that objective was assumed.

In the revised MPB analysis, based on Canfor's earlier 264 500 cubic metre uplift proposal, stands scheduled for harvest in the forest development plan were assumed to be harvested in the first five years of the harvest forecast and then, in order of priority, mountain pine beetle and spruce beetle infested stands followed by highly and moderately susceptible stands where pine are projected to be killed. In the next 15 years of the forecast, stands in the twenty-year plan are harvested. Harvest priorities in the plan include harvesting salvage losses and remaining susceptible stands. Canfor recognizes the need to revise the twenty-year plan if a larger AAC uplift is determined.

Harvest sequencing in the remainder of the forecast horizon (after 20 years) follows the 'relative poorest first' harvest rule as assumed in the base case.

Several alternative harvest forecasts were modelled based on the revised MPB analysis. The highest initial harvest level modelled was 357 000 cubic metres per year for 15 years, and this was followed by a medium-term level of about 175 000 cubic metres per year (about 15 percent below the medium-term level attained in the base case) before reaching a long-term harvest level similar to the base case.

A 327 000 cubic metre per year initial harvest level could be maintained for 15 years before declining in the medium term to about 183 000 cubic metres per year (about 9 percent below the level attained in the base case) and later reaching a long-term harvest level of 222 000 cubic metres per year (same as the base case). This forecast is similar to Canfor's most recent proposal for a 325 000 cubic metre AAC.

At about the 267 000 cubic metre per year initial harvest level for 15 years, there is a very small impact on the medium-term harvest level relative to the base case and no effect in the long-term.

Medium-term harvest levels are not dramatically affected by substantial changes in assumed initial harvest levels in the revised MPB analysis. This is because managed stand yield curves (using TIPSY) are applied to harvested stands (rather than natural stand yield tables using VDYP) which substantially increases the stand's growth and yield following harvest. In contrast, unharvested pine-leading stands (with greater than 60 percent pine) that are projected to be killed by the pine beetle regenerate after an assumed 20-year regeneration delay using slower-growing natural stand yield tables.

Given the harvest sequencing in the revised MPB analysis, the mainly mixed pine stands in the TFL and reliance on clearcutting with reserves, the percent of the total volume harvested that is pine varies very little even with significantly different alternative initial harvest levels. At the base case level of 237 000 cubic metres per year and at 267 000 cubic metres per year, the percent pine harvested over the first ten years in the forecast is 43 percent, while at the 327 000 cubic metre per year initial harvest level the pine harvested is projected to be 42 percent.

At the 327 000 cubic metre per year initial harvest scenario, about 45 percent is directed at stands with more than 60 percent pine over the first 10 years in the forecast, with this dropping significantly over the final five years in the short term (years 11 to 15) to only about 15 percent of the total harvest. At this level, a very high component of stands projected to be harvested in the short term is associated with mixed stands with less than a 50 percent pine component. Another consideration at this relatively high initial harvest level is the dependency in the forecast on residual balsam stands (described above under *residual balsam stands*) to provide medium-term harvest volumes, particularly in years 40 to 50, where at times over one-half (and as much as 80 percent in year 45) of the volume is derived from these stands. This underscores the importance of producing accurate volume estimates for these residual stands as well as the relative risk associated with larger short-term increases in the harvest level given the uncertainty in this factor in the medium term.

Given the potential risk to medium-term harvest levels associated with a high initial harvest level of 325 000 cubic metres per year coupled with the fact that many stands are being harvested in this scenario that do not contain a substantial pine component, I am not prepared to increase the AAC to the extent proposed by Canfor.

In determining an appropriate harvest level to capture the mountain pine beetle infestation in the TFL, I note that highly susceptible stands in the TFL have greater than 60 percent pine over 80 years of age. The total volume of these pine-leading stands was estimated in the analysis, as of 2003, to be 2.57 million cubic metres with close to 2.0 million cubic metres (about 77 percent) in pine. The current estimate is 2.5 million cubic metres of total volume given harvest levels in 2004 and 2005. These highly susceptible stands represent about 57 percent of all the susceptible pine volume greater than 60 years of age in the TFL. I believe it is both reasonable and prudent to expect that these stands should be salvaged over the next 10 years in order to capture the dead pine volumes before their economic shelf-life is over. This will reduce unsalvaged losses and allow for the conversion of affected stands to faster growing regenerated managed stands in support of medium-term harvest levels. The scheduling of harvest until the expected end of the attack (which under Canfor's "conservative" assumptions was 2008) should allow salvage before significant declines occur in the economic value of the stands. As I discuss in my "Reasons for Decision", I therefore believe an initial harvest level of 250 000 cubic metres per year to address the mountain pine beetle epidemic provides a reasonable balance between salvaging key pine-leading stands, while providing needed volumes in the future, particularly given uncertainties in the assumptions associated with medium-term harvest levels related to the growth and yield of residual balsam stands. I expect this level of harvest to be needed for 10 years to enable the salvage of the 2.5 million cubic metres of volume associated with highly susceptible pine-leading stands.

I am aware that this level of initial harvest could mean that about 0.5 million cubic metres of pine volume in moderately-susceptible stands (with 40 of 60 percent pine over 80 years of age) may remain as unsalvaged losses. However, salvage of these stands would result in the harvest of about 0.6 million cubic metres of non-pine volume (about 53 percent of the total stand volume) unless alternative silvicultural practices are employed such as selection harvesting. Harvesting the pine volumes in moderately susceptible stands in the short term using Canfor's current preferred practice of clearcutting would mean that a sizeable non-pine volume profile of the TFL would no longer be available to support the mid-term, and this could put the attainment of a reasonable medium-term harvest level at risk.

Increased harvesting operations related to an increase in the AAC can lead to an increased risk to biodiversity, habitat, riparian resources, and watershed integrity. This highlights the need for increased levels of retention to reduce the negative impacts on these values that may be associated with a greater rate of harvesting. In December 2005, the chief forester provided *Guidance on Landscape and Stand Level Structural Retention on Large-Scale Operations Associated with Mountain Pine Beetle Killed Timber*. The guidance is intended to assist forest professionals in the planning and implementation of salvage operations. In this document the chief forester provides a recommended proportion of stand-level retention based on opening size varying from 10 percent

retention for openings smaller than 50 hectares, 10 to15 percent for openings 50 to 250 hectares in size, 15 to 25 percent for openings 250 to1000 hectares in size, and greater than 25 percent retention for openings larger than 1000 hectares in size. I encourage Canfor to carefully consider all of the chief forester's guidance as they implement the AAC I have determined for TFL 18.

In implementing the newly determined AAC, I encourage the licensee to retain non-pine species as much as possible when harvesting susceptible stands in order to provide both the increased retention needed when large scale salvage operations are undertaken, and to better provide for mid-term timber supply. The other important reason to focus the AAC on pine is that this allows potential losses to be more fully captured in salvage operations.

I recommend that Canfor also assess any opportunities for protecting non-pine residual tree structure (seedlings, saplings and sub-canopy trees) in harvesting of pine-leading stands, as these may also enhance mid-term timber supply and biodiversity.

Canfor has committed in its Management Plan No. 10 to provide diverse tree species composition through regeneration practices. For example, future regeneration assumptions project less than seven percent of the land base will be greater than 50 percent pine. This should help provide more resilient future forests that are less prone to future mountain pine beetle epidemics.

I have predicated my decision on harvesting stands containing greater than 60 percent pine, and these stands include a considerable volume of non-pine species (on TFL 18 about 23 percent of the stand volume totalling 0.5 million cubic metres) which I recognize will be important to contribute to product mix needed by Canfor. In addition, there is a considerable non-pine component in current cutting permits and identified in approved or amended forest development plans that were prepared prior to the current epidemic. I strongly encourage the licensee to re-focus its initial harvest on stands with more than 60 percent pine where possible and to consider selection harvesting of stands with a lower proportion of pine to capture mountain pine beetle losses. These efforts are important to help ensure sufficient volumes are available to support the mid-term timber supply. Efforts by the licensee to leave non-pine volumes can then be factored in the next determination.

Reasons for Decision

I have considered the information discussed throughout this document, and I have reasoned as follows.

The 2005 timber supply analysis base case projection indicates an initial harvest level of 237 000 cubic metres per year can be sustained for 15 years. This initial harvest level is about 33 percent higher than the current AAC of 177 650 cubic metres. The harvest forecast then decreases by about 13 percent to a medium-term harvest level of 205 500 cubic metres per year after year 15. The medium-term level can be maintained for 55 years before increasing by eight percent in year 70 to a long-term harvest level of 222 000 cubic metres per year.

In determining AACs, my considerations typically identify factors which, considered separately, indicate reasons why the timber supply may be either greater or less than the

harvest levels projected for various periods in the base case. Some of these factors can be quantified and their implications assessed with reliability. Others may influence the assessment of the timber supply by introducing an element of risk or uncertainty, but cannot be quantified reliably at the time of the determination and must be accounted for in more general terms.

In my considerations, I identified no significant reasons other than factors associated with the mountain pine beetle epidemic why the base case in the timber supply analysis has been either overestimated or underestimated. After carefully examining each of the relevant factors under section 8 of the *Forest Act,* I concluded that, other than the mountain pine beetle related assumptions, the assumptions underlying the factors that form the basis of the base case are suitable for use in this determination and that no adjustments to the AAC I determine are necessary on their account.

In making this determination, I am particularly mindful of the potential impact of the mountain pine beetle epidemic on highly susceptible pine-leading stands with over 60 percent pine (averaging about 77 percent pine volume). The total pine and non-pine volume in these stands is about 2.5 million cubic metres. As reasoned under *mountain pine beetle epidemic*, I believe the appropriate scheduling of harvest over a 10-year period should enable the salvage of these volumes before their economic shelf-life is appreciably affected. This suggests a 250 000 cubic metre per year short-term harvest level should be sufficient to salvage stands highly susceptible to the mountain pine beetle.

I am aware that at Canfor's proposed harvest level of 325 000 cubic metres per year, the medium-term harvest level is projected to be about 183 000 cubic metres per year (about nine percent below the level projected in the base case). However, I am concerned that uncertainties associated with growth and yield estimates in residual balsam stands in particular could put at risk the attainment of projected medium-term harvest levels. The revised MPB analysis indicates that the initial harvest level of 327 000 cubic metres is predicated on considerable harvesting of non-pine leading stands, yet non-pine volumes may be important to retain in support of mid-term harvests.

I also recognize in my determination that the mountain pine beetle is not the only forest health risk in the TFL. Canfor has been harvesting an average of 40 000 cubic metres per year between 1999 and 2003 to salvage spruce beetle attacked stands. This determination needs to allow for this level of salvage to continue.

After carefully considering all the available information, I have reasoned that an AAC of 290 000 cubic metres will allow for salvaging both pine-leading stands attacked by the mountain pine beetle and spruce stands attacked by the spruce bark beetle. Some of this considerable increase in the AAC can also be directed towards the salvage of trees killed by other forest health agents such as windthrow, fire and the western balsam bark beetle. In recent years, the licensee has directed most of its harvest to the salvage of trees killed by a variety of forest health agents and this capacity to respond gives me confidence that they will continue to provide this focus in the future. Salvage harvesting of attacked stands in a timely manner not only enables the economic utilization of dead wood but also provides for their reforestation with faster growing regenerated managed stands that will be an important supply of timber in the medium term.

In my considerations above, I am concerned that increased harvesting operations can lead to increased risk to watershed hydrology, biodiversity, habitat and other non-timber values. I therefore strongly encourage Canfor to consider the chief forester's recent guidance on the retention strategies related to large-scale salvage operations and to report on the extent to which they were able to follow those guidelines prior to the next determination.

Most of the susceptible pine volume in the TFL is in mixed stands with a significant non-pine volume component. The non-pine component in mountain pine beetle attacked stands needs to be retained where feasible to provide both the increased retention needed when large scale salvage operations are undertaken, and to better provide for mid-term timber supply. I therefore encourage the licensee to retain as much of the non-pine species as possible when harvesting including promising areas of advanced regeneration.

The licensee has approved cutblocks in cutting permits and forest development plans that were identified before the mountain pine beetle epidemic and these include spruce-leading stands. Subject to mill requirements for a product mix and to other forest health concerns in spruce stands, I strongly urge the licensee to use whatever flexibility exists to re-direct the non-pine harvest to susceptible pine-leading stands given the importance of non-pine volumes in support of the mid-term timber supply.

The licensee's performance in using innovative ways to harvest pine from mixed-wood stands to retain non-susceptible species, taking into consideration factors such as windthrow hazard, and to direct the harvest on stands with more than 60 percent pine will be key considerations in future determinations. Under "Implementation", I therefore request the licensee report on its performance in this regard.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties in the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years and that reflects current management practices as well as the socio-economic objectives of the Crown, and the need to address the mountain pine beetle epidemic, can be best achieved on TFL 18 by establishing an AAC of 290 000 cubic metres.

This determination is effective March 9, 2006, and will remain in effect until a new AAC is determined, which must take place within five years of the effective date of this determination.

If significant new information is made available to me, major changes occur in the management assumptions upon which I have predicated this decision, or the mountain pine beetle outbreak progresses substantially differently than assumed in support of this decision, then I am prepared to revisit this determination sooner than the five years required by legislation.

Implementation

In the period following this decision and leading to the subsequent determination, I encourage the licensee to undertake the tasks and studies noted below that I have also described further in the appropriate sections of this rationale document. I understand that

Canfor is already committed to monitoring and managing the mid-term timber supply risks and opportunities that I note in several of the projects below. These projects are important to help reduce the risk and uncertainty associated with key factors that affect the future timber supply in TFL 18, particularly in the mid-term. I therefore request that before the next determination:

- *Volume estimates for existing unmanaged stands:* the licensee monitor the high volume stands (greater than 500 cubic metres per hectare projected in the analysis) to confirm or revise the estimated extent of these stands in the TFL.
- *Site productivity estimates:* the licensee monitor performance in managed stands to confirm or revise that the estimated gains in growth and yield are correct given the risk to mid-term timber supply.
- *Residual balsam stands:* the licensee continue to improve the estimates regarding existing stand volumes and growth and yield for these stands given their importance in supporting mid-term harvest levels. This information may be critical in supporting the next determination when the current AAC and its impact on harvest flows in the future need to be re-examined.
- *Forest health – spruce bark beetle:* the licensee undertake the needed ground surveys to determine the status of the spruce bark beetle population and thus its risk to timber supply.
- *Retention of non-pine volumes:* the licensee report on its performance in retaining non-pine volumes from mixed-wood stands, taking into account factors like windthrow hazard, and to direct harvesting to stands with more than 60 percent pine. Non-pine volumes will be important to support mid-term harvest levels.

Henry Benskin
Deputy Chief Forester

March 8, 2006

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157 Consolidated to October 21, 2004, reads as follows:

Allowable annual cut

8 (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (2) or (3),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

(a) by written order may postpone the next determination under subsection (1) to a date that is up to 10 years after the date of the relevant last determination, and

(b) must give written reasons for the postponement.

(3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she

(a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and

(b) must give written reasons for setting the earlier date.

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area,

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine a an allowable annual cut for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silviculture treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area.

(c) Repealed [2003-31-02]

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Documents attached:

Appendix 3: Minister's letter of July 28, 1994

Appendix 4: Minister's memo of February 26, 1996

File: 10100-01

JUL 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V 1X4

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
Ministry of Forests
OFFICE OF THE MINISTER

MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

Re: **The Crown's Economic And Social Objectives Regarding Visual Resources**

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

.../2

In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis.*

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests